

WHAT IS CLAIMED IS:

1. A method for treating or protecting an animal against a microbe-induced disease comprising the step of inhibiting DNA methyltransferase activity in said
5 microbe.
2. The method of claim 1 wherein said DNA methyltransferase is a DNA adenine methyl transferase.
- 10 3. The method of claim 1 wherein said inhibiting DNA methyltransferase activity results from inhibiting DNA methyltransferase enzyme activity.
4. The method of claim 1 wherein said inhibiting DNA methyltransferase activity results from inhibiting expression of DNA methyltransferase.
- 15 5. The method of claim 1 wherein said animal is a human patient.
6. The method of claim 1 wherein said microbe is a bacterium.
- 20 7. The method of claim 6 wherein said bacterium is a gram positive bacterium.
8. The method of claim 7 wherein said gram positive bacterium is a bacterium of *Staphylococcus* species, *Streptococcus* species, *Bacillus* species,
25 *Corynebacterium* species, *Clostridium* species, *Actinomyces* species, *Enterococcus* species, or *Streptomyces* species.
9. The method of claim 6 wherein said bacterium is a gram negative bacterium.

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10. The method of claim 9 wherein said gram negative bacterium is a bacterium of *Acinetobacter* species, *Neisseria* species, *Pseudomonas* species, *Brucella* species, *Agrobacterium* species, *Bordetella* species, *Escherichia* species, *Shigella* species, *Yersinia* species, *Salmonella* species, *Klebsiella* species, *Enterobacter* species, *Hemophilus* species, *Pasteurella* species, *Streptobacillus* species, spirochetal species, *Campylobacter* species, *Vibrio* species, or *Helicobacter* species.

11. The method of claim 6 wherein said bacterium is a bacterium of species *Staphylococcus aureus*; *Staphylococcus saprophyticus*; *Streptococcus pyogenes*; *Streptococcus agalactiae*; *Streptococcus pneumoniae*; *Enterococcus faecalis*; *Enterococcus faecium*; *Bacillus anthracis*; *Acinetobacter baumanii*; *Corynebacterium diphtheriae*; *Clostridium perfringens*; *Clostridium botulinum*; *Clostridium tetani*; *Neisseria gonorrhoeae*; *Neisseria meningitidis*; *Pseudomonas aeruginosa*; *Legionella pneumophila*; *Escherichia coli*; *Yersinia pestis*; *Haemophilus influenzae*; *Helicobacter pylori*; *Campylobacter fetus*; *Vibrio cholerae*; *Vibrio parahemolyticus*; *Trepomema pallidum*; *Actinomyces israelii*; *Rickettsia prowazekii*; *Rickettsia rickettsii*; *Chlamydia trachomatis*; *Chlamydia psittaci*; *Brucella abortus*; *Agrobacterium tumefaciens*; or *Francisella tularensis*.

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12. A method of treating or protecting against a microbe-induced disease in a mammal afflicted with said disease, or at risk of becoming afflicted with said disease, comprising administering to said mammal a therapeutically effective dose of a methyl transferase inhibitor.

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13. The method of claim 12 wherein said DNA methyltransferase is a DNA adenine methyl transferase.

14. The method of claim 12 wherein said inhibiting DNA methyltransferase activity results from inhibiting DNA methyltransferase enzyme activity.

15. The method of claim 12 wherein said inhibiting DNA methyltransferase 5 activity results from inhibiting expression of DNA methyltransferase.

16. The method of claim 12 wherein said animal is a human patient.

17. The method of claim 12 wherein said microbe is a bacterium.

10 18. The method of claim 17 wherein said bacterium is a gram positive bacterium.

15 19. The method of claim 18 wherein said gram positive bacterium is a bacterium of *Staphylococcus* species, *Streptococcus* species, *Bacillus* species, *Corynebacterium* species, *Clostridium* species, *Actinomyces* species, *Enterococcus* species, or *Streptomyces* species.

20 20. The method of claim 17 wherein said bacterium is a gram negative bacterium.

25 21. The method of claim 20 wherein said gram negative bacterium is a bacterium of *Acinetobacter* species, *Neisseria* species, *Pseudomonas* species, *Brucella* species, *Agrobacterium* species, *Bordetella* species, *Escherichia* species, *Shigella* species, *Yersinia* species, *Salmonella* species, *Klebsiella* species, *Enterobacter* species, *Hemophilus* species, *Pasteurella* species, *Streptobacillus* species, spirochetal species, *Campylobacter* species, *Vibrio* species, or *Helicobacter* species.

30 22. The method of claim 17 wherein said bacterium is a bacterium of species *Staphylococcus aureus*; *Staphylococcus saprophyticus*; *Streptococcus*

pyogenes; *Streptococcus agalactiae*; *Streptococcus pneumoniae*; *Enterococcus faecalis*; *Enterococcus faecium*; *Bacillus anthracis*; *Acinetobacter baumanii*; *Corynebacterium diphtheria*; *Clostridium perfringens*; *Clostridium botulinum*; *Clostridium tetani*; *Neisseria gonorrhoeae*; *Neisseria meningitidis*; *Pseudomonas aeruginosa*; *Legionella pneumophila*; *Escherichia coli*; *Yersinia pestis*; *Haemophilus influenzae*; *Helicobacter pylori*; *Campylobacter fetus*; *Vibrio cholerae*; *Vibrio parahemolyticus*; *Trepomena pallidum*; *Actinomyces israelii*; *Rickettsia prowazekii*; *Rickettsia rickettsii*; *Chlamydia trachomatis*; *Chlamydia psittaci*; *Brucella abortus*; *Agrobacterium tumefaciens*; or *Francisella tularensis*.

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23. A method of reducing bacterial virulence, comprising contacting bacteria with an agent that alters the bacteria's native level of DNA methyltransferase activity thereby inhibiting virulence of the bacteria.

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24. The method of claim 23 wherein contacting bacteria with an agent that alters the bacteria's native level of DNA methyltransferase activity results in altering the bacteria's native level of methylation of adenine in a polynucleotide of said bacteria.

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25. The method of claim 23 wherein contacting bacteria with an agent that alters the bacteria's native level of DNA methyltransferase activity results in altering the bacteria's native level of methylation of adenine in a GATC tetranucleotide of the bacteria.

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26. The method of claim 23 wherein contacting bacteria with an agent that alters the bacteria's native level of DNA methyltransferase activity results in altering the bacteria's native level of methylation of adenine in a GANTC pentanucleotide of the bacteria.

27. The method of claim 23 wherein the bacteria are pathogenic bacteria
30 that cause disease in a mammal.

28. The method of claim 23 wherein the agent reduces the DNA methyltransferase activity.

29. The method of claim 28 wherein said agent reduces said activity by
5 binding to a DNA methyltransferase enzyme.

30. The method of claim 23 wherein said DNA methyltransferase is a DNA adenine methyl transferase.

10 31. The method of claim 23 wherein said inhibiting DNA methyltransferase activity results from inhibiting DNA methyltransferase enzyme activity.

32. The method of claim 23 wherein said inhibiting DNA methyltransferase activity results from inhibiting expression of DNA methyltransferase.

15 33. The method of claim 23 wherein said animal is a human patient.

34. The method of claim 23 wherein said microbe is a bacterium.

20 35. The method of claim 23 wherein said bacterium is a gram positive bacterium.

36. The method of claim 23 wherein said gram positive bacterium is a bacterium of *Staphylococcus* species, *Streptococcus* species, *Bacillus* species,
25 *Corynebacterium* species, *Clostridium* species, *Actinomyces* species,
Enterococcus species, or *Streptomyces* species.

37. The method of claim 23 wherein said bacterium is a gram negative bacterium.

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38. The method of claim 23 wherein said gram negative bacterium is a bacterium of *Acinetobacter* species, *Neisseria* species, *Pseudomonas* species, *Brucella* species, *Agrobacterium* species, *Bordetella* species, *Escherichia* species, *Shigella* species, *Yersinia* species, *Salmonella* species, *Klebsiella* species, *Enterobacter* species, *Hemophilus* species, *Pasteurella* species, *Streptobacillus* species, spirochetal species, *Campylobacter* species, *Vibrio* species, or *Helicobacter* species.

39. The method of claim 23 wherein said bacterium is a bacterium of species *Staphylococcus aureus*; *Staphylococcus saprophyticus*; *Streptococcus pyogenes*; *Streptococcus agalactiae*; *Streptococcus pneumoniae*; *Enterococcus faecalis*; *Enterococcus faecium*; *Bacillus anthracis*; *Acinetobacter baumanii*; *Corynebacterium diphtheriae*; *Clostridium perfringens*; *Clostridium botulinum*; *Clostridium tetani*; *Neisseria gonorrhoeae*; *Neisseria meningitidis*; *Pseudomonas aeruginosa*; *Legionella pneumophila*; *Escherichia coli*; *Yersinia pestis*; *Haemophilus influenzae*; *Helicobacter pylori*; *Campylobacter fetus*; *Vibrio cholerae*; *Vibrio parahemolyticus*; *Trepomena pallidum*; *Actinomyces israelii*; *Rickettsia prowazekii*; *Rickettsia rickettsii*; *Chlamydia trachomatis*; *Chlamydia psittaci*; *Brucella abortus*; *Agrobacterium tumefaciens*; or *Francisella tularensis*.

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40. A method of reducing bacterial virulence, comprising:

contacting bacteria with an agent that alters the bacteria's native level of DNA methyltransferase activity thereby altering the bacteria's native level of methylation of adenine in a GATC tetranucleotide of the bacteria, and thereby inhibiting virulence of the bacteria.

41. A method of treating a microbe-induced condition in a mammal afflicted with said condition, comprising administering to said mammal a therapeutically effective dose of a composition comprising a methyl transferase inhibitor and a pharmacological excipient.

42. The method of claim 41 wherein said condition is caused by *Agrobacterium* spp., *Rhizobium* spp. or *Helicobacter* spp.

5 43. The method of claim 41 wherein said condition is caused by a member of the alpha subdivision of gram-negative bacteria.

44. The method of claim 41 wherein said mammal is a human.